

INSTITUTION	NATIONAL AND KAPODISTRIAN UNIVERSITY OF ATHENS						
SCHOOL	SCHOOL OF SCIENCE						
DEPARTMENT	INFORMATICS AND TELECOMMUNICATIONS						
COURSE LEVEL	UNDERGRADUATE						
COURSE TITLE	Wireless Links						
COURSE CODE	ΕΠ13	Semester	8	ECTS	6		
TEACHING HOURS per week	THEORY	3	SEMINAR.	0	LABORATORY	1	
COURSE TYPE	Electives (ΠΜ)						
	K	E1	E2	E3	E4	E5	E6
	B					E	
URL	https://eclass.uoa.gr/courses/D74/						
EXPECTED PRIOR KNOWLEDGE/ PREREQUISITES AND PREPARATION:	Knowledge of basic principles and technologies on wireless transmission, and electromagnetic waves. Prerequisite courses: 1) a first course on Electromagnetism, Optics, Modern Physics (K12).						
TEACHING AND EXAMINATIONS LANGUAGE:	GREEK						
THE COURSE IS OFFERED TO ERASMUS STUDENTS	NO						

COURSE CONTENT

The course presents and analyzes the behavior of electromagnetic waves in the atmosphere, space, external and internal operating environments of mobile communications, as well as popular propagation models. This course presents fundamental concepts for understanding, evaluating and predicting the effects of the spread of electromagnetic waves across the spectrum and in various scenarios.

STUDENT LEARNING OBJECTIVES

Teaching-Learning Goals-Expected Learning Outcomes

The aim of the course is to provide students with a deeper understanding of the principles of propagation of electromagnetic waves in space or in the air, and to be able to use popular models for study and prediction of their propagation in different environments (with emphasis on mobile systems communications).

Upon successful completion of the course the student will be able to:

- Predict the effects of the propagation of electromagnetic waves in the atmosphere, space and urban environments.

- Calculate link budgets and select antennas, frequencies and routes for wireless communication systems.
- Describe the statistical characteristics of multi-way signals.
- Identify factors that prevent or disturb the spread of radio waves in different scenarios.
- Design the physical layer of various types of wireless telecommunication networks.

TEACHING AND LEARNING METHODS - ASSESSMENT													
TEACHING METHOD	In Class (Face to Face)												
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	<p>Learning process supported by the e-class platform (Announcements, Teaching Material, Exercises, Recorded Videlectures)</p> <p>Email communication</p> <p>Live streaming of lectures</p> <p>Ability to view recorded lectures (https://delos.uoa.gr/opendelos/search?dp=di&crs=ac29ebb6).</p>												
<p>TEACHING ORGANIZATION <i>Describe in detail the way and methods of teaching:</i> Enhanced Lectures, Online Lectures, Seminars, Tutorial, Laboratory, Laboratory Exercise, Study & analysis of literature, Practice (Positioning), Interactive teaching, Developing a project, Individual / group work Telework (reference to tools) etc.</p> <p><i>Details of the student's study hours for each learning activity and hours of non-guided study are shown to ensure that the total workload at the semester corresponds to the ECTS</i></p>	<p>Theory is presented with slide projection. The lectures are broadcasted live and recorded so that students can rehearse the lectures. The laboratory is organized through exercises that the students deliver through eclass twice during the semester.</p> <table border="1"> <thead> <tr> <th>Activity</th> <th>Student Workload (hours)</th> </tr> </thead> <tbody> <tr> <td>Lectures</td> <td>39</td> </tr> <tr> <td>Laboratory</td> <td>8</td> </tr> <tr> <td>Preparation for the Laboratory</td> <td>30</td> </tr> <tr> <td>Independent Study</td> <td>73</td> </tr> <tr> <td>Total Course (25 hours of workload per unit of credit)</td> <td>150</td> </tr> </tbody> </table>	Activity	Student Workload (hours)	Lectures	39	Laboratory	8	Preparation for the Laboratory	30	Independent Study	73	Total Course (25 hours of workload per unit of credit)	150
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<p>ASSESSMENT OF STUDENTS <i>Description of the assessment process</i></p> <p><i>Assessment Methods, Formative or Concluding, Multiple Choice Test, Quick Response Questions, Test Development Questions, Problem Solving, Written Work, Report / Report, Oral Examination, Public Presentation, Laboratory Work, Other / Other</i></p> <p><i>Fully defined evaluation criteria are mentioned and if and where they are accessible to students.</i></p>	<p>Students are assessed by written examination and the reporting of laboratory exercises. The written examination covers the theoretical part, and counts for 75% of the final grade. In the laboratory part, 2 laboratory exercises are delivered. The grade of the laboratory exercises counts for 25% of the final grade.</p> <table border="1"> <thead> <tr> <th>Assessment methods</th> <th>Number</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Written examination</td> <td>1</td> <td>75%</td> </tr> <tr> <td>Laboratory</td> <td>1</td> <td>25%</td> </tr> </tbody> </table>	Assessment methods	Number	Percentage	Written examination	1	75%	Laboratory	1	25%			
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LITERATURE AND STUDY MATERIALS / READING LIST

- A. Kanatas, G. Pantos, "Wireless Communications", Papasotiriou Publishing, 2017.
- S. Kotsopoulos, "Principles and Modeling of Wireless Transmission", Tziolas Publishing, 2015.
- S. R. Saunders, A. Aragón - Zavala (edited by D. Vougioukas), "Antennas and Dissemination for Wireless Communications Systems", Pedio Publishing, 2017.
- Ch. Kapsalis, P. Kottis, "Antennas-Wireless Connections", Tziolas Publishing, 2013.